CLAIMS

What is claimed is:

1. A motor vehicle, comprising an internal combustion engine, an air inlet passageway in communication to aspirate the engine, an air inlet valve positioned in the passageway and being moveable to control air flow through the passageway to the engine, a valve actuator coupled for opening and closing the air inlet valve, at least one ancillary consumer unit powered by the engine, at least one engine sensor including an engine speed sensor, and an engine control unit that is operatively connected to the valve actuator, ancillary consumer unit and engine speed sensor in order to control engine operation, the engine control unit being arranged during idling of the engine:

(a) to monitor the operation of the ancillary consumer unit and to calculate an engine demand depending at least partly on the operation of the ancillary unit;

(b) to monitor the engine idling speed and to determine if the expected engine demand can be met at the engine idling speed;

(c) and when the engine demand exceeds that available at the engine idling speed, to determine a desired degree of opening of the air inlet valve to meet the expected engine demand;

wherein when the engine demand exceeds that available at the engine idling speed, the engine control unit is arranged to open the air inlet valve to a position at which the steady state airflow would exceed that necessary to meet the expected engine demand, and to calculate an exponential decay factor and then to close the air inlet valve according to the calculated decay factor towards the desired opening so that the rate at which the engine control unit closes the air inlet valve varies in proportion with the monitored engine idling speed.

2. The motor vehicle according to Claim 1, wherein the at least one ancillary unit is powered directly by the engine.

3. The motor vehicle according to Claim 1, wherein the at least one ancillary unit is powered indirectly by the engine.

4. A method of controlling an internal combustion engine in a motor vehicle having an air inlet passageway, an air inlet valve positioned in the passageway, a valve actuator, at least one ancillary consumer unit, at least one engine sensor including an engine speed sensor, and an engine control unit that is operatively connected to the valve actuator, ancillary consumer unit and engine speed sensor, the method comprising the steps of:

i) aspirating the engine through the air inlet passageway while running the engine at an idling speed;

ii) using the air inlet valve to control the air flow through the passageway to the engine;

iii) using the valve actuator to control engine aspiration by opening and closing the air inlet valve;

iv) powering the ancillary consumer unit directly or indirectly by the engine;

v) using the engine control unit to monitor the operation of the ancillary unit and to calculate an engine demand depending at least partly on the operation of the ancillary unit;

vi) using the engine control unit to monitor the engine idling speed and to determine if the expected engine demand can be met at the engine idling speed;

vii) when the engine demand exceeds that available at the engine idling speed, using the engine control unit to determine a desired degree of opening of the air inlet valve to meet the expected engine demand;

viii) when the engine demand exceeds that available at the engine idling speed, using the engine control unit to open the air inlet valve to a position at which the steady state airflow would exceed that necessary to meet the expected engine demand, and then to close the air inlet valve towards the desired degree of opening; and

ix) using the engine control unit to calculate an exponential decay factor and then in step viii) closing the air inlet valve according to the decay factor so that the rate at which the engine control unit closes the air inlet valve varies in proportion with the monitored engine speed.

5. The method according to Claim 4, wherein the decay rate for the calculated exponential decay factor varies inversely with the monitored engine speed.

6. The method according to Claim 4, wherein the method further comprises the step of allowing the air flow to temporarily overshoot that necessary to meet the expected engine demand.

7. The method according to Claim 6, wherein the engine is a spark ignition engine and the method includes the steps of:

- using the engine control unit to initiate ignition with engine sparks at a desired engine spark angle; and
- using the engine control unit to steady engine power during the period when the air flow temporarily overshoots by varying the engine spark angle.

8. The method according to Claim 4, wherein the degree to which the engine control unit initially opens the air inlet valve varies inversely with the monitored engine speed.